ABSTRACT

There is provided a reaction system capable of, in the feeding of liquid stored after gas-liquid mixing into waste water to be treated of a reaction tank, conditioning the interior of the reaction tank to a pressurized state so as to simultaneously accomplish enhancement of utilization efficiency of gas phase and further reduction of the amount of excess sludge generated. There is further provided a biological purification process characterized in that microorganisms fulfill purification activity in a pressurized reaction tank having a pressure other than deep water pressure applied thereto. Preferably, together with water to be treated, reactant gas such as pure oxygen, ozone-containing oxygen (ozonized oxygen) or air is fed into the pressurized reaction tank. With respect to gas and liquid fed into the reaction tank, preferably, reactant gas is fed in the form of dissolved gas or microbubbles by means of a gas-liquid mixing unit (line atomizer). Preferably, the pressurized reaction tank is fitted with a support for microorganisms as means for increasing the habitant density of microorganisms engaging in reaction and retaining such microorganisms.